Remarks

The following remarks are submitted in response to the Final Official Action of the Examiner mailed May 20, 2003. Claims 1-22 remain pending in the application. Entry of these remarks and reconsideration by the Examiner to that end is respectfully requested.

As a preliminary matter, Applicants believe that the Finality of this Office Action is improper. As noted in MPEP § 706.07(a):

> Furthermore, a second or any subsequent action on the merits in any application or patent undergoing reexamination proceedings will not be made final if it includes a rejection, on newly cited art, other than information submitted in an information disclosure statement filed under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17 (p), <u>of any claim not amended by applicant or patent owner in spite of the fact that other claims may have been amended to require newly cited art</u>.

(Emphasis Added). In the present case, independent claims 15, and 20-22 were not amended in Applicant's previous Amendment (filed on March 27, 2003), but these claims are currently rejected under newly cited art. As such, and according to MPEP § 706.07(a), it is believed that the Finality of this Office Action is improper, and respectfully requests that it be withdrawn.

In paragraph 3 of the Final Office Action, the Examiner rejected claims 1, 21 and 22 under 35 U.S.C. §102(e) as being anticipated by Jopson et al. (U.S. Patent No. 6,380,533). Regarding claims 1 and 22, the Examiner states that Jopson et al. suggest a polarization controlled optical energy source that includes a laser source (100) that produces a light output that has at least two polarization states. The Examiner states that <u>all</u> laser sources have two polarizations states.

The Examiner also states Jopson et al. suggests a polarization medium (110) positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state (citing Jopson et al., column 3, lines 25-40, and Figures 5 and 6), and that it is inherent that at

an incidence angle of the light to medium, the polarization medium selects and attenuating each of the at least two polarization states equally or substantially equally and provides linear polarization along an axis that is at about 45 degrees to both distinct polarization states (citing Jopson et al., Figure 2).

After careful review, Applicants must respectfully disagree that claims 1, 21 and 22 are anticipated or rendered obvious in view of Jopson et al. First, and very briefly, the Examiner's statement that <u>all</u> laser sources have two polarization states is simply not true. For example, virtually all edge-emitting semiconductor lasers have only a single polarization. Therefore, the Examiner cannot assume, or claim it to be inherent, that <u>all</u> laser sources have two polarization states.

In addition, Applicants believe that the Examiner's interpretation of Jopson et al., at least as it relates to the present claims, is inappropriate. The Examiner cites to column 3, lines 25-40, and Figures 5 and 6 of Jopson et al. as suggesting a polarization medium (110) positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state. The cited passage of Jopson et al. states:

> The Poincare Sphere Technique has several shortcomings. First, although the input of two distinct polarization states is required, the input of a third distinct polarization state is often necessary. Where the resulting PMD vector would be coplanar with the vectors representing the first two polarization states in Stokes space, subsequent calculations using data only from these first two polarization states would be impossible because there would be division by zero. In such an instance, additional data must be obtained from the input of a third distinct polarization state. This input of an additional polarization state adds complexity to the overall testing system because a circular or elliptical polarizer must be used to input this third polarization state whereas linear polarizers are sufficient for the first two input polarization states.

(Jopson et al., column 3, lines 25-40). The relevance of this passage is not readily evident to

Applicants. As can be seen, this passage of Jopson et al. appears to suggest that the output of the device under test (130 of Figure 5) must have at least two polarization states, and in some cases three. In operation, the polarizing device (110 of Figure 5) appears to be a linear polarizer that imparts a chosen polarization state to the light beam before providing the polarized light beam to the device under test. The device under test (e.g. fiber) then takes the linear polarized light input from the polarizing device (110) and produces two (or more) distinct polarization states, which are then provided to the polarization measuring device 140. More specifically, Jopson et al. state:

> A general prior art apparatus for measuring PMD that is common to both methods is shown in block diagram form in FIG. 5. A light source 100 capable of operating at different frequencies, such as a tunable laser, inputs a light beam of a chosen frequency. A polarizing device 110, such as one or more linear polarizers, then imparts a chosen polarization state to the light beam. A control block 120, which could be a computer, controls the frequency of light source 100 and chooses the polarization imparted by polarizing device 110. The polarization state of the light beam may be represented by a vector in Stokes space and in the Poincare sphere. The light beam then passes through the device under test 130 which could be a span of optical fiber. A measuring device 140, such as a polarimeter, measures the polarization state of the light beam at the output of the device under test. The data obtained from the measuring device is then analyzed in analysis block 150, which could be a computer, to determine the PMD vector characteristics.
>
> The Poincare Sphere Technique requires the input of at least two distinct polarization states, i.e. production of two light beams having distinct polarization states. For each input polarization state, the input frequency is varied and the output polarization state measured. The resulting data is then differentiated with respect to frequency to obtain the magnitude and direction of the PMD vector.

(Emphasis Added)(Jopson et al., column 3, lines 1-17). Thus, and as can be seen, the polarizing device 110 appears to impart a chosen polarization state to the input light beam, which is then provided to a span of optical fiber. The output of the optical fiber is provided to a polarization measuring device 140. Jopson et al. state that at least two distinct polarization states, i.e. production

of two light beams having distinct polarization states, are required for the Poincare Sphere Technique to determine the PMD vector characteristics of the light output. In discussing the polarization effects of a fiber, Jopson et al. state:

> Polarization mode dispersion refers to an effect that an optical device, such as a span of optical fiber, has on the separate polarizations of a light beam. A light beam can be approximated as having electrical components that vibrate at right angles to the direction of travel. In the simple case of a short fiber section the polarization or state of polarization of the light beam can be thought of as the direction of these right angle vibrations, where the light beam travels in a straight line. In the more general case, these components are superimposed in a more complex way. As shown in FIG. 1, within a short optical fiber section 10, an orthogonal set of two polarized waveguide modes 20 and 30 can be found which have electric field vectors aligned with the symmetry axes of the fiber. The polarization of a light beam propagating through the fiber section can be represented by vector components aligned with these polarization waveguide modes of the fiber as shown in FIG. 2. In FIG. 2, the polarization waveguide modes 20 and 30 are shown as two axes. The input polarization 40 is represented as the vector sum of two components 50 and 60 which are aligned with the polarization waveguide modes of the fiber section.
>
> In ideal fiber, which has a perfect circular cross-section and is free from external stresses, the propagation properties of the two polarized waveguide modes are identical. However, imperfections introduced in the manufacturing process may result in fiber that is not perfectly circular. In addition, fiber that has been installed may suffer from external stresses such as pinching or bending. These manufacturing imperfections and external stresses cause the two polarized waveguide modes to have different propagation characteristics which in turn gives rise to polarization mode dispersion, or "PMD".

(Emphasis Added)(Jopson et al., column 1, lines 21-52). As can be seen, and with reference to Figure 2 of Jopson et al., the polarization waveguide modes 20 and 30 of the fiber are shown on the two axes, and the input polarization 40 is represented as the vector sum of two components 50 and 60, which are aligned with the polarization waveguide modes of the fiber section. However, this certainly does not disclose or even imply that the input polarization 40 has two polarization states, as

the Examiner suggests. Instead, it merely states that the input polarization state 40 can be represented as the vector sum of two components 50 and 60. The fiber appears to break the input polarization state 40 into two (or more) polarization states that are aligned with the two polarized waveguide modes 20 and 30 of the fiber. The two (or more) polarization states of the fiber are then provided to the polarization measuring device 140 for PMD analysis, as discussed above.

In contrast to the foregoing, claim 1 recites:

> 1. (Previously Amended) A polarization controlled optical energy source comprising:
> a laser source element that produces a light output that has at least two polarization states; and
> a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally.

As can be seen, there does not appear to be anything in Jopson et al. that suggest a laser source element that produces a light output that has at least two polarization states, and a polarization medium that polarizes the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally, as recited in claim 1.

Although it is unclear, it appears the Examiner may be suggesting that the polarizing device (110 of Figure 5) itself corresponds to the polarization medium of claim 1. Even under this interpretation, however, Jopson et al. fail to discloses or suggests elements of claim 1, including a polarizing device that polarizes the light output from a laser source (100 of Figure 5) into a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally.

It appears that the Examiner may be relying on an inherent disclosure argument. The Examiner states that it is inherent that at an incidence angle of the light to medium, the polarization medium selects and attenuating each of the at least two polarization states equally or substantially equally (citing Jopson et al., Figure 2). Thus, the Examiner appears to be suggesting that the polarizing device 110 of Jopson et al. inherently polarizes the light output of the laser source 100 into a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally. However, this is clearly unfounded.

As discussed above, Figure 2 of Jopson et al. illustrates the polarization waveguide modes 20 and 30 of the fiber on the two axes. The input polarization 40 (i.e. output of the linear polarizer 110) is merely represented as the vector sum of two components 50 and 60, which are aligned with the polarization waveguide modes of the fiber section. This certainly does not indicate that it is inherent that the polarizing device 110 of Jopson et al. selects and attenuates each of at least two polarization states equally or substantially equally, as the Examiner suggests. Rather, Figure 2 of Jopson et al. merely shows that the input polarization 40 (i.e. output of the linear polarizer 110) can be represented as the vector sum of two components 50 and 60. Regardless of how the input polarization in represented in a graph, the polarizer device 110 nonetheless physically polarizes the light from the laser source 100 into the input polarization 40 state.

Specifically with respect to inherency, Applicant would like to point out that:

> The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To

> establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)

(see, MPEP § 2112). In the present case, it cannot readily be argued that the polarizing device 110 of Jopson et al. necessarily selects and attenuates each of at least two polarization states equally or substantially equally, as recited in claim 1. There is simply no disclosure in Jopson et al. to support such an assertion. In fact, it would appear that Jopson et al. would work fine for its intended purpose if the polarizing device 110 did not select and attenuate each of at least two polarization states of the laser source 100 equally or substantially equally. As such, and for the reasons given above and for other reasons, claim 1 is believed to be clearly patentable over Jopson et al. For similar and other reasons, claim 22 is believed to be clearly patentable over Jopson et al.

In paragraph 4 of the Final Office Action, the Examiner rejected claims 1, 21 and 22 under 35 U.S.C. §102(b) as being anticipated by Joseph et al. (U.S. Patent No. 3,609,008). First, Applicants note that the Examiner recites the name "Joseph et al." for U.S. Patent No. 3,609,008. However, since U.S. Patent No. 3,609,008 issued to Joseph F. Dillon, Jr., Applicants will refer to this patent as Dillon.

The Examiner states that Dillon suggests a polarization controlled optical energy source that includes a laser source (20) that produces a light output that has at least two polarization states. Again, the Examiner states that all lasers have two polarization states. The Examiner then states that Dillon suggest a polarization medium (22) positioned in proximal relation to the laser source element

(citing Dillon, Figure 4) for polarizing the light output into a third polarization state (citing Dillon, column 3, lines 48-65). The Examiner again states that it is inherent that at an incident angle of the light to medium then the polarization medium is selecting and attenuating each of the at least two polarization states equally or substantially equally.

Like above, Applicants take issue with the Examiner's statement that all laser sources have two polarization states, because it is simply not true. As noted above, virtually all edge-emitting semiconductor lasers have only a single polarization. Therefore, the Examiner cannot assume, or claim it to be inherent, that all laser sources have two polarization states.

In addition, and after reviewing Dillon, it does not appear that Dillon discloses or suggests a polarization medium positioned in proximal relation to a laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally, as recited in claim 1. The Examiner cites to Figure 4 of Dillon. With respect to Figure 4, Dillon state "[t]he apparatus of this figure consists of laser oscillator 20 producing light beam 21, which passes through plane polarizer 22, focusing means 23, $TlFeF_3$ modulator 24 and detector 25 in succession." (Emphasis Added). The Examiner appears to be suggesting that because Dillon places a plane polarizer 22 adjacent a laser source, the plane polarizer 22 must necessarily polarize the light output of the laser source 20, which produces at least two polarized states, into a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally. However, this is simply not the case.

First, Dillon does not state anywhere that the laser oscillator 20 produces two polarization states. Even if it did, however, and unless the plane polarizer 22 is properly aligned relative to both

of the at least two polarization states of the laser source, the polarizer will not select and attenuate each of the at least two polarization states equally or substantially equally, as recited in claim 1.

In attempting to read Dillon onto claim 1, the Examiner cites to column 3, lines 48-64, which states:

> In a different arrangement, two or three discrete polarization states may result. Since rotation is sensitive to a change in direction of the magnetization (or course, providing that the direction is such that there is a component in the beam direction), two discrete rotations result from a reversal, for example, for a magnetization direction lying along the axis of beam traversal. These two rotations are equal in magnitude and opposite in sign. A third state corresponds to an orthogonal magnetization direction. For the simple case in which this is normal to the beam traversal direction, no magnetization component results in such traversal direction and the beam travels through the crystal without magnetic rotation. Of coarse, beam traversal directions which do not coincide with <100> crystallographic directions may result in twice as many polarization states as there are magnetization axis having different value components in the traversal direction.

However, Applicants do not see the relevance of this passage. It appears that this passage is discussing the rotations caused by the $TlFeF_3$ modulator 24, and not the plane polarizer 22. According to this passage, it appears that the plane polarizer 22 provides a polarized input to the $TlFeF_3$ modulator 24, which then produce two or three discrete polarization states. Thus, the $TlFeF_3$ modulator 24 clearly does not polarize the light output of a laser source, which produces at least two polarized states, into a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally. Instead, the cited passage appears to suggest that the $TlFeF_3$ modulator 24 takes a polarized light input, and produces two or three discrete polarization states.

The Examiner repeats the statement that it is inherent that at an incidence angle of the light to

medium, the polarization medium selects and attenuating each of the at least two polarization states equally or substantially equally. No support for this statement is provided. As indicated above:

> The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)

(see, MPEP § 2112). It cannot readily be argued that the polarizer 22 of Dillon necessarily selects and attenuates each of at least two polarization states equally or substantially equally, as recited in claim 1. There is simply no disclosure or suggestion in Dillon to support this assertion. In fact, it would appear that Dillon would work fine for its intended purpose if the polarizer 22 did not select and attenuate each of at least two polarization states of the laser source 20 equally or substantially equally. As such, for the reasons given above as well as other reasons, claim 1 is believed to be clearly patentable over Dillon For similar and other reasons, claims 21 and 22 are also believed to be clearly patentable over Dillon.

In paragraph 5 of the Final Office Action, the Examiner rejected claims 2-20 under 35 U.S.C. §103(a) as being anticipated by Jopson et al. (U.S. Patent No. 6,380,533) in view of Davis et al. (U.S. Patent No. 6,069,905). For the reasons set forth above, as well as other reasons, dependent claims 2-20 are believed to be clearly patentable over Jopson et al. in view of Davis et al.

In addition, however, and as detailed in Applicant's Amendment filed March 25, 2003, this rejection is clearly improper because Davis et al. is disqualified as prior art under 35 U.S.C. §103. Davis et al. was filed on December 31, 1997, and issued on May 30, 2000. The present application was filed on May 23, 2000. As such, Davis et al. would only qualify as prior art under 35 U.S.C. §102(e). In view thereof, the Examiner's rejection of claims 3, 8, 9, 13, 14, 20 and 22 must have been made under 35 U.S.C. §102(e)/103. However, 35 U.S.C. § 103(c) states:

> *35 U.S.C. 103. Conditions for patentability; non-obvious subject matter.*
>
> *****
>
> (c) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

35 U.S.C. 103(c) applies to all utility, design and plant patent applications filed on or after November 29, 1999, which includes the present application. The subject matter of Davis et al. and the subject matter of the present application were, at the time the invention was made, owned by or subject to an obligation of assignment to a common assignee, namely, Honeywell International Inc., of Morristown, New Jersey, U.S.A. In view of the foregoing, Davis et al. is disqualified as prior art under 35 U.S.C. §103(c), and thus the rejection of claims 2-20 is clearly improper and must be withdrawn as a matter of law.

Having thus addressed the Examiner's grounds for rejections, Applicants believe pending claims 1-22 are clearly in condition for allowance. Reconsideration to that end is respectfully

requested. If a telephone conference might be of assistance, please contact the undersigned attorney at 612-677-9050.

Respectfully submitted,

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By their attorney,

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